

Abstract

Aims: Bone surgery and graft as the current bone treatment methods are not always successful to fulfil bone repair in extensive injuries as well as bone degenerative diseases such as osteoporosis. Due to the limited capacity of bone remodeling, the demand for alternative approaches remains to be met, as a result efforts in ex vivo generation of bone forming cells, osteoblasts, and their further application in cell therapy as a promising approach are of vital prominence from a scientific perspective.

Material and methods: In the current study, we wished to examine the nature of the relationship between osteoblast differentiation and miR-210 in a unique human mesenchymal stem cells, unrestricted somatic stem cells (USSCs). 7 days following miR-210 transduction, osteoblast markers at gene level namely, Runx2, col I in addition to osteocalcin were assessed using qRT-PCR, and Alizarin red S staining was also carried out to observe histochemical changes.

Results: The results that follows from our findings represents a marked increase in osteoblast differentiation marker, osteocalcin, following miR-210 transduction in USSCs. Furthermore, Alizarin red S staining indicated calcium nodules presence. Interestingly, for the first time, human USSCs differentiation into osteoblasts was performed in our research.

Conclusion: On the whole, miR-210 enhancing role in human USSC revelation may provide helpful insights into surmounting bone related issues in bone regenerative field by combination of both gene and cell therapy.

Key words: miR-210.Osteoblasts. Differentiation.USSC